2.0 PROPOSED ACTION

2.1 PROPOSED FACILITIES

Iroquois Gas Transmission System L.P, (Iroquois) proposes to construct and operate the ELI Project that would provide 175,000 Dth/d of natural gas to consumers in Suffolk County, New York and other surrounding counties. Iroquois proposes to construct an approximately 29.1-mile, 20-inch diameter natural gas pipeline that would begin from a tap off Iroquois' existing 24-inch mainline in Long Island Sound in New Haven County, Connecticut, continuing southerly onto the Long Island mainland at Shoreham, New York. From landfall, the pipeline would generally be collocated with the William Floyd Parkway and the Long Island Expressway to its terminus at a proposed cogeneration facility. Figure 2.1-1 shows the general location of the proposed facilities. Iroquois's ELI Project involves the construction or modification of the following facilities:

> Mainline: 29.1 miles of new 20-inch Outer Diameter (OD) pipeline in New Haven County, Connecticut and Suffolk County, New York;
>
> Meter Stations: One new meter station is proposed along the ELI pipeline at approximate Milepost (MP) 29.1;
>
> Ancillary Facilities: One marine tap interconnection and facilities for the attachment of a pig launcher in Long Island Sound in Connecticut state waters, three mainline valves (MP 17.5, 22.7, and 29.1), and one pig receiving facility that would be housed within the meter station layout at the project terminus;
>
> Dover Compressor Station: A discharge gas cooler would be added to Iroquois' compressor station in Dover, Dutchess County, New York. Iroquois received approval to construct the compressor station in a separate FERC certificate (Docket No. CP00-232), but has not completed the construction of it yet;
>
> Devon Compressor Station: A new 20,000 horsepower compressor station would be constructed at Iroquois' existing mainline valve site located in Milford, Fairfield County, Connecticut;
>
> Brookfield Compressor Station: Piping and compressor and pipe modifications and ancillary facilities to accept natural gas from the AGT System would be performed at a compressor station that Iroquois is planning to construct in Brookfield, Connecticut. Iroquois has filed a separate Application with the FERC for construction of the compressor station in November 2001; and,
>
> Temporary Facilities: Iroquois would also require pipe yards, storage yards, access roads, and contractor staging areas, which would be temporarily used during construction of this project.

2.1.1 Aboveground Facilities

The proposed ELI Project would involve the installation of several aboveground facilities along the pipeline route. These facilities are described below and summarized in table 2.1.1-1.

TABLE 2.1.1-1
Proposed Aboveground Facilities

State	County	Facility	Approximate Milepost	Description
Connecticut	New Haven	Marine Tap Interconnection	0.0	Includes interconnection for operational pigging.
New York	Suffolk	MLV-2	17.5	Mainline valve within a security chain link fence.
	Suffolk	MLV-3	22.7	Mainline valve within a security chain link fence.
	Suffolk	MLV-4	29.1	Mainline valve within a security chain link fence.
	Suffolk	Receiver Facility	29.1	Meter building and pig receiver.
	Suffolk	Meter Station	29.1	Meter building and pig receiver.

Mainline Valves

Three onshore mainline block valves would be located within the pipeline ROW at MPs 17.5, 22.7, and 29.1. The block valve assemblies would include a below grade remotely operable valve; a bypass line to allow re-pressuring or pressure equalization prior to opening the valve; and associated pipe and fittings. An aboveground communications satellite dish for all three valves would be located on a pole near the area and/or telephone lines, which would be used to allow remote operation of the valve. A chain link perimeter security fence will surround the valves. See figure 2.1.1-1 for a typical mainline valve assembly configuration.

Meter Stations

The project includes one metering point that would be connected at the ELI pipeline interconnection location at the project terminus (MP 29.1). This station would be located on the southern side of the Long Island Expressway. See figure 2.1.1-2 for a conceptual plot plan of the proposed meter station. The proposed meter station site would include the following components:

Security chain link fence;

Meter and control building;

Flow control valve;

Gas measurement flow devices;

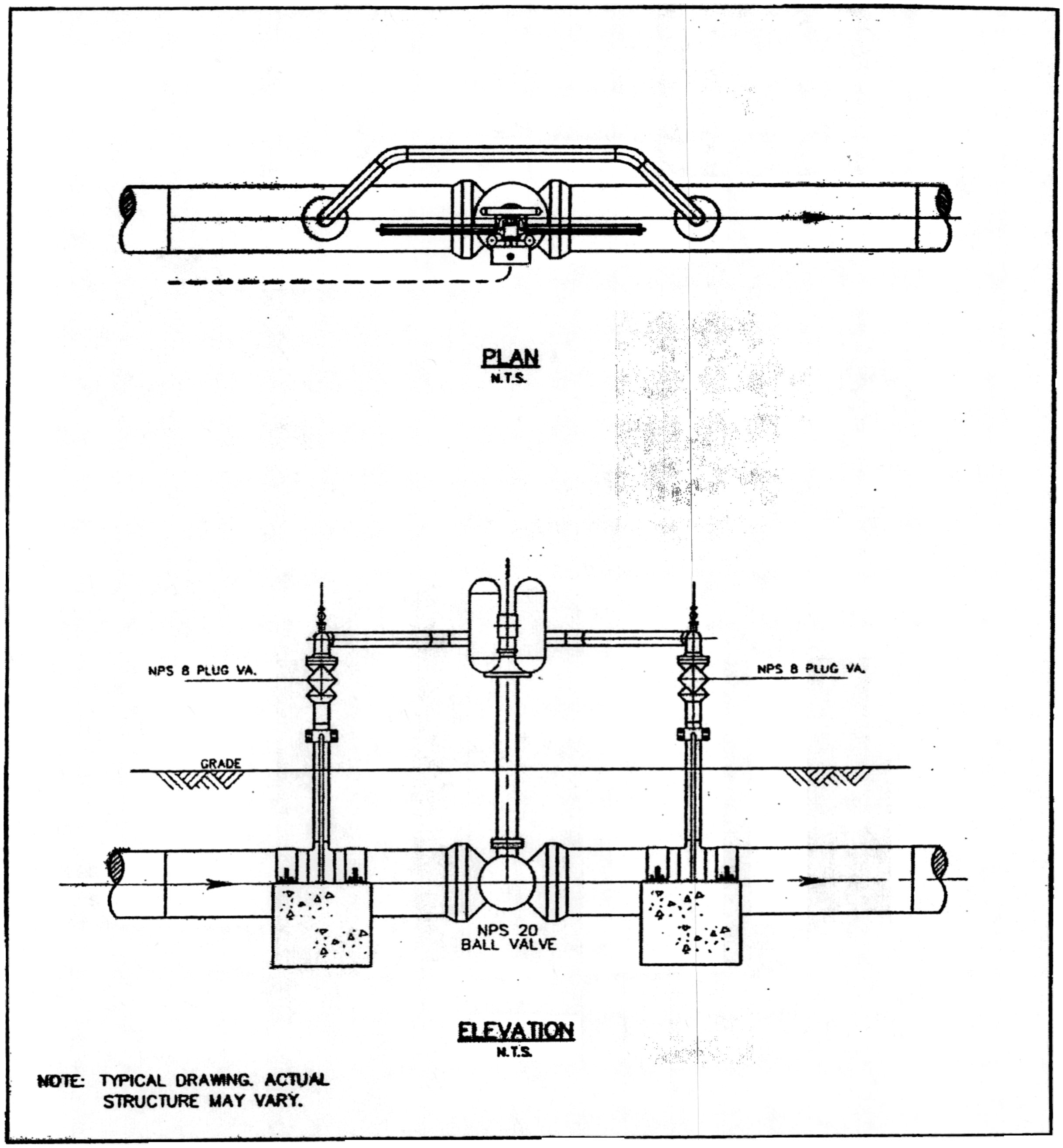

Figure 2.1.1-1 - Mainline Valve Arrangement.

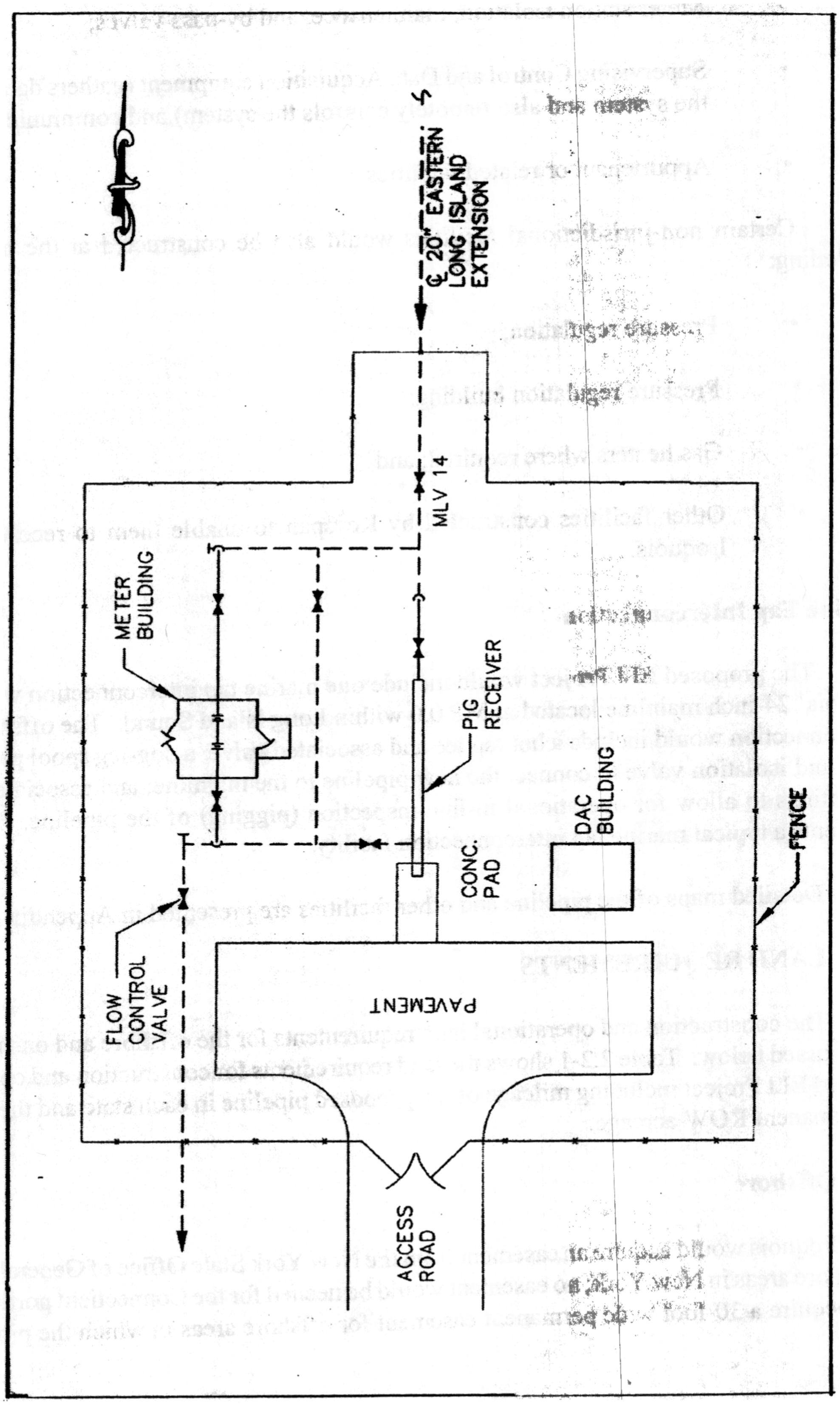

Figure 2.1.1-2 - Proposed Meter Station Conceptual Arrangement.

Meter station isolation, maintenance, and by-pass valves;

Supervising Control and Data Acquisition equipment (gathers data from throughout the system and also remotely controls the system) and communications link; and,

Appurtenant or related facilities.

Certain non-jurisdictional facilities would also be constructed at the meter station site including:

Pressure regulation;

Pressure regulation building;

Gas heaters where required; and

Other facilities constructed by Keyspan to enable them to receive the gas from Iroquois.

Marine Tap Interconnection

The proposed ELI Project would include one marine tap interconnection with the existing Iroquois' 24-inch mainline located at MP 0.0 within Long Island Sound. The offshore marine tap interconnection would include a hot tap tee and associated valve, a dog-leg spool piece with check valve and isolation valve to connect the new pipeline to the mainline; and associated pipe, valves and fittings to allow for operational in-line inspection (pigging) of the pipeline. Figure 2.1.1-3 represents a typical marine tap interconnection facility.

Detailed maps of the pipeline and other facilities are presented in Appendix B.

LAND REQUIREMENTS

The construction and operational land requirements for the offshore and onshore segments are discussed below. Table 2.2-1 shows the land requirements for construction and operation of the proposed ELI Project including mileage of the proposed pipeline in each state and the construction and permanent ROW acreage.

Offshore

Iroquois would acquire an easement from the New York State Office of General Services for the offshore areas in New York; no easement would be needed for the Connecticut portion. Iroquois would acquire a 30-foot wide permanent easement for offshore areas in which the pipeline would be laid.

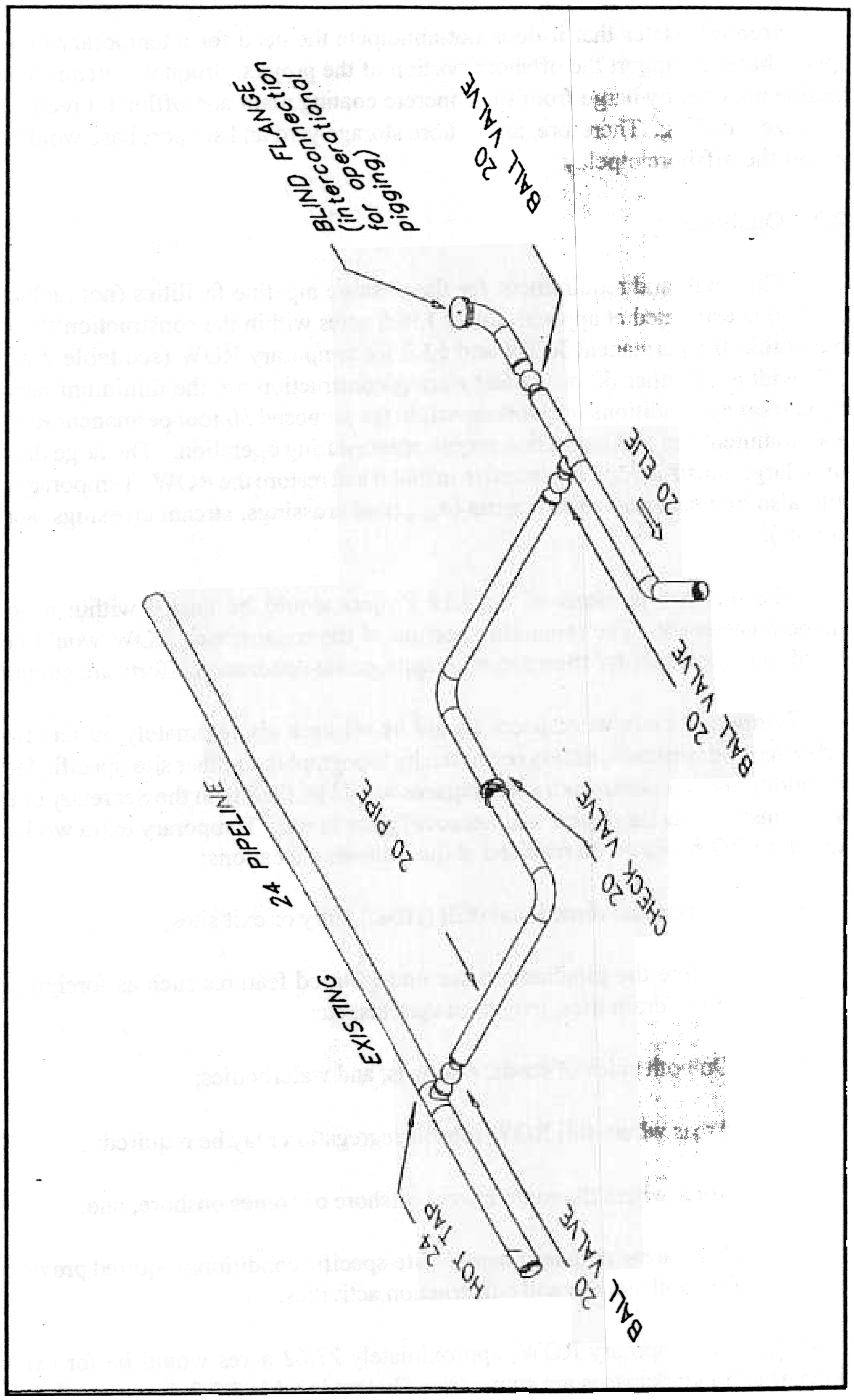

Figure 2.1.1-3 - Conceptual Layout of Marine Tap Interconnect

Iroquois states that it does not anticipate the need for a temporary pipe storage yard and support base to support the offshore portion of the project. Iroquois intends to deliver the marine pipeline material by barge from the concrete coating plant and offload directly to the lay barge to minimize handling. Therefore, an onshore storage yard and support base would not be required to support the offshore pipelay.

2.2.2 Onshore

The total land requirement for the onshore pipeline facilities (not including aboveground facilities) is estimated at approximately 136.5 acres within the construction ROW, including 72.7 acres within the permanent ROW and 63.8 for temporary ROW (see table 2.2-1). The proposed ROW widths of either 60 or 75 feet during construction are the minimum necessary to provide adequate safety conditions for workers while the proposed 50 foot permanent ROW is adequate for proper maintenance and inspection requirements during operation. The large diameter pipe would require large construction equipment to install it and restore the ROW. Temporary extra workspaces would also be needed in certain areas (e.g., road crossings, stream crossings, and mainline valve locations).

The onshore portions of the ELI Project would be buried within a new 50-foot-wide permanent easement. The remaining portion of the construction ROW would be temporary and returned to landowners for their use after appropriate restoration efforts are complete.

Temporary extra workspaces would be set back approximately 50 feet from the edges of waterbodies and wetlands, unless restricted by topographic or other site-specific factors. Locations of any additional temporary extra workspaces would be filed with the Secretary of the Commission prior to construction for review and approval prior to use. Temporary extra workspaces along the construction ROW would be required at the following locations:

Horizontal directional drill (HDD) entry or exit sites;

Where the pipeline crosses under buried features such as foreign pipelines, utility lines, drain tiles, irrigation systems, etc;

On both sides of roads, railroads, and waterbodies;

Areas where full ROW topsoil segregation may be required;

Areas where the route moves offshore or comes onshore; and,

Other areas as determined by site-specific conditions required providing extra space for spoil storage and construction activities.

Within the temporary ROW, approximately 27.62 acres would be for extra workspaces. Locations of extra workspaces are summarized below in table 2.2.2-1.

TABLE 2.2-1
Temporary and Permanent ROW[1]

State	Land Use	MP	Length (miles)	Construction ROW (acres)	Permanent ROW (acres)	Temporary ROW[3]
Connecticut[2]						
Offshore	Open Water	0.0-0.04[4]	0.04	1.4	0.13	1.27
		0.04-7.54[5]	7.5	90.93	27.26	63.64
New York[2]		7.54-15.72[5]	8.2	99.2	26.75	69.43
Offshore	Open Water	15.72-16.8[6]	1.1	26.2	3.92	22.26
		16.8-17.0[4]	0.2	7.3	0.72	6.55
		17.0-17.1[4]	0.1	3.6	0.36	3.27
Total			17.1	228.6	62.14	
New York						
Onshore	Beach	17.13-17.15	0.02	3.19	0.41	2.78
	Forest	17.15-17.53	0.38	4.18	2.35	1.83
	Road ROW	17.53-17.54	0.01	0.03	0.03	0.00
	Forest	17.54-17.89	0.35	3.43	2.1	1.33
	Road ROW	17.89-17.90	0.01	0.06	0.06	0.00
	Forest	17.90-18.69	0.79	7.95	4.8	3.15
	Road ROW	18.69-21.95	3.26	28.5	19.73	8.77
	Forest	21.95-22.08	0.13	1.48	0.82	0.66
	Road ROW	22.08-24.20	2.12	19.8	12.83	6.97
	Forest	24.20-24.58	0.38	3.46	2.31	1.15
	Open Space	24.58-24.61	0.03	0.54	0.20	0.34
	Road ROW	24.61-24.62	0.01	0.09	0.09	0.00
	Open Space	24.62-24.66	0.04	1.06	0.17	1.89
	Forest	24.66-25.57	0.91	8.46	5.53	2.93
	Road ROW	25.57-25.98	0.41	3.82	2.44	1.38
	Forest	25.95-26.06	0.08	0.89	0.53	0.36
	Open Space	26.06-26.30	0.24	2.17	1.45	0.72
	Road ROW	26.30-26.63	0.33	2.98	1.99	0.99
	Contractor	26.63	--	13.8	0.0	13.8
	Road ROW	26.63-26.95	0.32	4.25	1.95	2.3
	Forest	26.95-27.11	0.16	1.85	1.03	0.82
	Road ROW	27.11-27.13	0.02	0.09	0.09	0.00
	Forest	27.13-27.64	0.51	5.32	3.1	2.22
	Cemetery	27.64-27.68	0.04	0.57	0.24	0.33
	Forest	27.68-27.89	0.21	1.97	1.23	0.74
	Road ROW	27.89-27.90	0.01	0.06	0.06	0.00
	Agriculture	27.90-28.61	0.71	7.74	4.31	3.43
	Forest	28.61-29.08	0.47	8.77	2.87	5.9
Total Onshore			12.0	136.5	72.72	63.79
Project Total			29.1	365.1	134.86	230.21

Source: ENSR

[1] Excludes proposed permanent ROW for pipeline sections to be installed by HDD and boring where no land disturbance would occur.

[2] Land affected during operation reflects a 30-foot-wide easement area and does not include the estimated 2,710 acres potentially affected by anchor scars and cable sweep.

[3] Includes temporary and extra workspaces.

[4] Construction ROW assumes a 300-foot-wide construction ROW.

[5] Construction ROW assumes a 100-foot-wide construction ROW.

TABLE 2.2.2-1
Land Requirements and Land Use for Extra Workspace Areas Associated with the ELI Project

Milepost	Land Use	Dimension of Work Area (sq. ft.)	Acreage Affected (ac)	Reason For Workspace
17.08 to 17.15		175 x 30	0.12	Staging area for landfall point
17.08 to 17.15		150 x 350	1.21	Staging area for landfall point
17.18 to 17.23		50 x 285	0.33	Material and equipment storage for landfall point
17.27 to 17.31		25 x 225	0.13	Material and equipment storage for landfall point
17.50 to 17.53		50 x 175	0.20	Road crossing at Keyspan parcel
17.53 to 17.55		25 x 100	0.06	Road crossing at Keyspan parcel
17.71 to 17.72		4,705 sq. ft.	0.11	Material and equipment storage
17.87 to 17.89		10 x 90	0.02	Road Crossing at North Country Road
17.87 to 17.89		15 x 100	0.03	Road Crossing at North Country Road
17.90 to 18.00		10 x 513	0.12	Road Crossing at North Country Road
17.90 to 17.95		15 x 280	0.10	Road Crossing at North Country Road
17.95 to 17.96		2,119 sq. ft.	0.05	Road Crossing at North Country Road
17.96 to 17.98		15 x 125	0.04	Road Crossing at North Country Road
18.45 to 18.57		15 x 610	0.21	Spoil Storage and Staging Area
18.68 to 18.69		50 x 100	0.11	Road crossing of Highway 25A
18.72 to 18.73		50 x 125	0.14	Road crossing of Highway 25A
19.52 to 19.61		9,102 sq. ft.	0.21	Extra Workspace for increased slope
22.06 to 22.08		50 x 185	0.21	Road crossing of Middle Country Road
22.12 to 22.14		50 x 120	0.14	Road crossing of Middle Country Road
22.73 to 22.80		15,923 sq. ft.	0.37	Spoil storage and staging area
24.58 to 24.62		10,140 sq. ft.	0.23	Staging area
24.60 to 24.61		438 sq. ft.	0.01	Staging area
24.62 to 24.65		19,765 sq. ft.	0.45	Staging area
24.63 to 24.66		15,048 sq. ft.	0.35	Staging area
24.78 to 24.80		65 x 100	0.15	Staging area
25.94 to 25.95		50 x 130	0.15	Road crossing of William Floyd Parkway
25.98 to 25.99		50 x 100	0.11	Road crossing of William Floyd Parkway
26.63 to 26.92		400 x 1500	13.78	Proposed pipeyard
26.81 to 26.86		44,741 sq. ft.	.02	Spoil storage and staging area
26.86 to 26.89		55 x 220	0.28	Spoil storage and staging area
26.89 to 26.92		25 x 160	0.09	Spoil storage and staging area
26.95 to 26.98		25 x 90	0.05	Road crossing of the Long Island Expressway
26.95 to 26.97		50 x 150	0.17	Road crossing of the Long Island Expressway
27.09 to 27.11		50 x 85	0.10	Road Crossing of Middle Island Road
27.12 to 27.15		50 x 130	0.15	Road Crossing of Middle Island Road
27.36 to 27.39		50 x 200	0.23	Equipment and material storage
27.51 to 27.52		50 x 100	0.11	Carmans River crossing
27.55 to 27.56		50 x 100	0.11	Carmans River crossing
27.64 to 27.68		50 x 200	0.23	Equipment and material storage
27.87 to 27.89		50 x 90	0.10	Road crossing of Yaphank Avenue
27.90 to 27.92		50 x 120	0.14	Road crossing of Yaphank Avenue
	Upland Forest			

TABLE 2.2.2-1 (continued)

Land Requirements and Land Use for Extra Workspace Areas Associated with the ELI Project

Milepost	Land Use	Dimension of Work Area (sq. ft.)	Acreage Affected (ac)	Reason For Workspace
27.97 to 28.61	Open Space/ Upland Forest	15 x 3380	1.16	Topsoil Stripping
28.95 to 29.03	Upland Forest	20 x 360	0.17	Equipment and material storage
28.95 to 29.02	Upland Forest	60 x 370	0.51	Equipment and material storage
29.08 to 29.17	Upland Forest	168,168 sq. ft.	3.86	KeySpan tie-in point

[1] Areas given as square feet are irregularly shaped.

The ELI Project would also require pipe storage and contractor yards for each construction spread, which would be located off the construction ROW. There would also be a contractor warehouse/staging yard located along the proposed pipeline at MP 26.6, approximately 200 feet west of the proposed pipeline route.

Access roads are also required for construction so the contractor may move personnel, equipment and material to the pipeline ROW. Public roads would be used for access roads to the greatest extent possible.

Iroquois has proposed five access roads for use during the construction of the ELI Project. Of this total, three would be permanent and two would be temporary. Permanent access roads would be retained and used to allow access to service the pipeline and for routine inspections. Temporary access roads would not be used after the completion of construction. The first permanent access road would be located at approximate MP 17.5 (PAR-1). This road is private and located within the KeySpan property. The second permanent access road (PAR-2) is also private, and is located from approximate MP 26.3 to 26.7. The third permanent access (PAR-3) road would be located at MP 29.1. This is a private road, which would be constructed from Sills Road to the proposed meter station. The first temporary access road (TAR-1) would be located on KeySpan property at approximate MP 17.7 while the second one would be located at about MP 26.6. This second road would provide access to the contractor pipeyard adjacent to the pipeline alignment.

Temporary and permanent land requirements for all the ELI Project aboveground facilities are shown below in table 2.2.2-2.

One marine tap facility would be constructed to interconnect the ELI pipeline to Iroquois' existing 24-inch mainline in Long Island Sound. The construction workspace for this interconnection would be located within a footprint of 60,000 sq. ft (1.4 acres). Upon completion of construction, the marine tap interconnection would be located on an approximate 5,625 sq. ft (0.13 acre) area (table 2.2-1). The temporary workspace use in the construction of the interconnection would be allowed to revert back to pre-construction conditions.

TABLE 2.2.2-2
Land Requirements for Aboveground Facilities

State	County	Facility	Approximate Milepost	Permanent/ Operation ROW (acres)	Temporary/ Construction ROW (acres)	Total
NY	Suffolk	Meter Station	29.1	0.23	3.63	3.86
		MLV-2[1]	17.5	NA	NA	NA
		MLV-3[1]	22.7	NA	NA	NA
		MLV-4[1]	29.1	NA	NA	NA
		Receiver[2]	29.1	0.23	3.63	3.86
		Project Total		0.23	3.63	3.86

[1] No additional acreage impact as this facility lies within the pipeline permanent ROW.
[2] This acreage is combined within the meter station. Pig receiver would be housed within the meter station area; hence this acreage has not been added into the project total.

CONSTRUCTION PROCEDURES

This section describes the general procedures proposed by Iroquois for the construction and operation of the pipeline and aboveground facilities.

Iroquois proposes to design, operate, and maintain the proposed project in accordance with 49 CFR Part 192, *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards* (refer to section 3.12, Reliability and Safety) and other applicable Federal and state regulations.

Iroquois would implement the construction and restoration procedures identified in our *Upland Erosion Control, Revegetation, and Maintenance Plan (Plan)* and *Wetland and Waterbody Construction and Mitigation Procedures (Procedures).* In addition, Iroquois would prepare a project-specific Spill Prevention, Containment, and Countermeasure (SPCC) Plan to aid in preventing and mitigating spills of hazardous materials.

During construction, Iroquois would assign at least one environmental inspector for each active construction spread to monitor environmental compliance. All construction and contractor personnel would be required to attend environmental training before construction and periodically during construction. We would also inspect construction and restoration of the proposed project, independent of Iroquois's environmental inspectors.

Iroquois anticipates construction for the offshore portion of the proposed project to begin in the fall of 2003 ending in the winter or spring of 2003/4. Iroquois expects the offshore construction to be completed by March 1, 2004. Iroquois anticipates the start of construction for the onshore pipeline on Long Island and upstream facilities would begin in the spring of 2004 and be completed by the in-service date of November 1, 2004.

General Offshore Construction Procedures

The pipeline would be installed by a lay barge, designed especially for this type of marine construction, which would provide a floating work platform (figures 2.3.1-1 and 2.3.1-2). The pipe

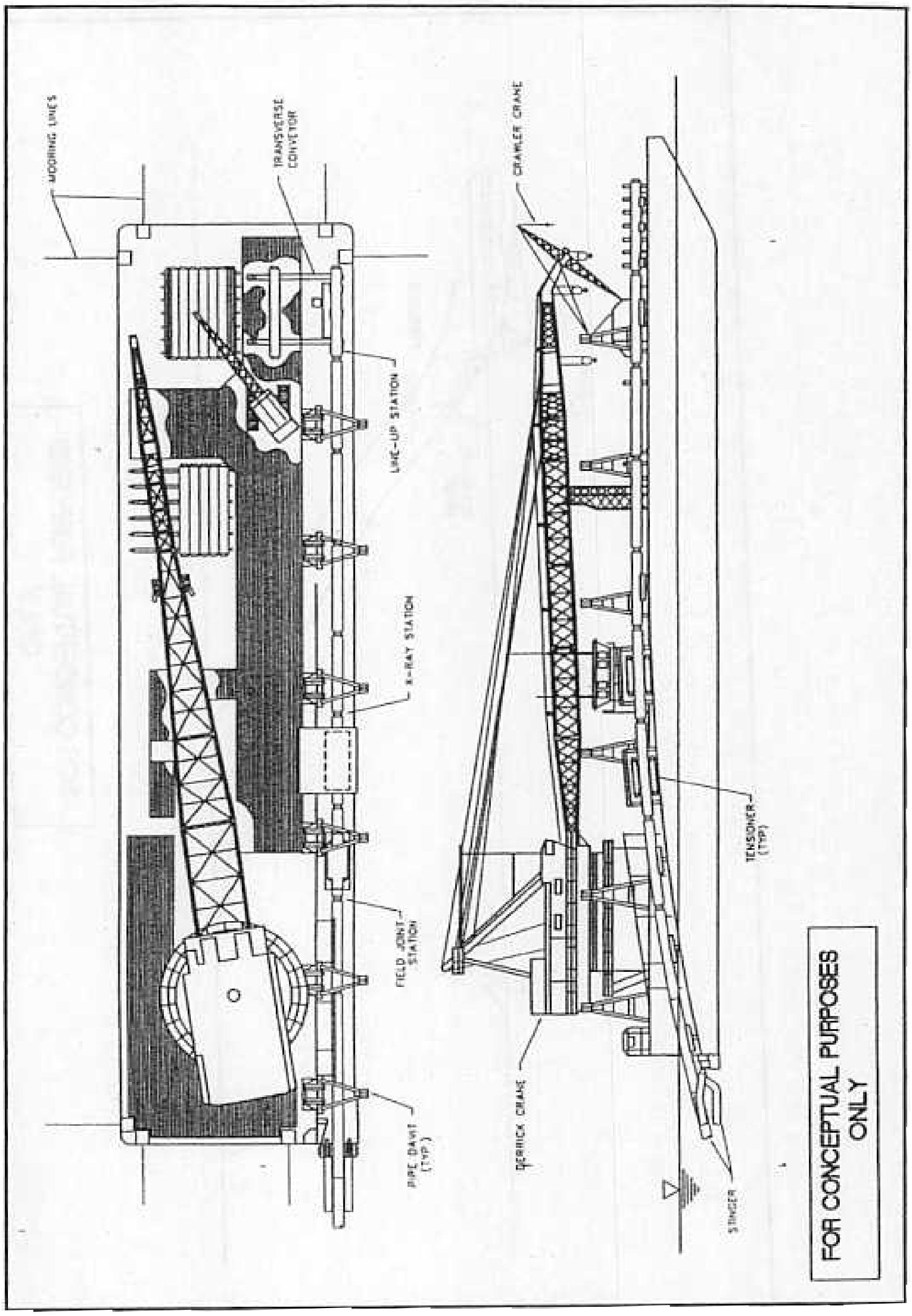

Figure 2.3.1-1 - Typical Offshore Pipeline Derrick/Pipe **Barge**

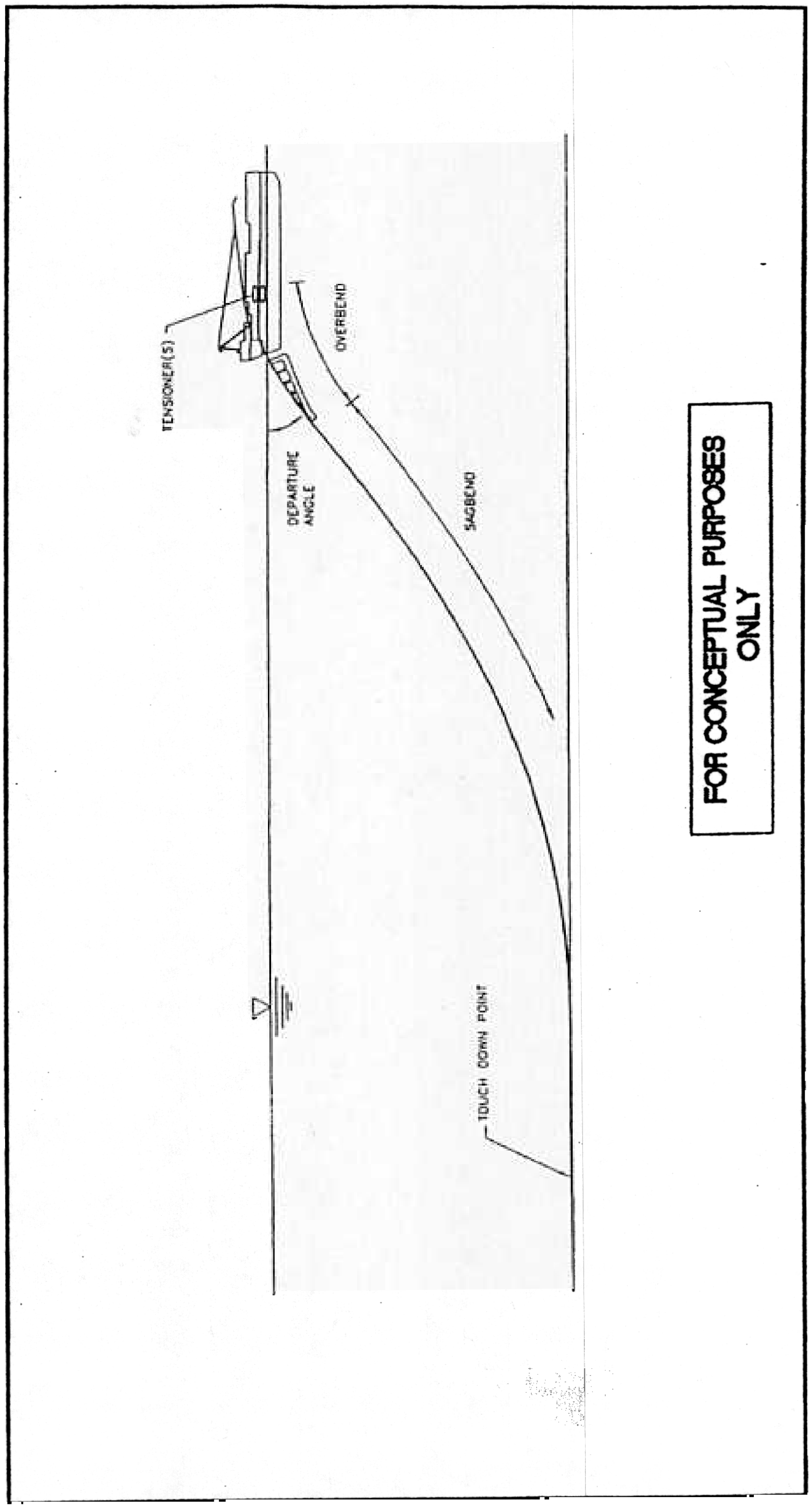

Figure 2.3.1-2 - Typical Laybarge Profile

joints would be moved on assembly-line conveyors and welded together to make one continuous pipeline. Each pipeline weld would be inspected and corrosion coating would be added. The gap in the concrete coating at welded field joints would be filled with quick-setting concrete or other suitable material to provide a continuous protective coating.

The lay barge would advance by pulling on mooring anchors. The anchors would be placed in the desired position by anchor-handling tugs. Bow anchors usually extend several thousand feet ahead of the lay barge, and provide most of the traction for pulling the barge forward. Breast anchors and stern anchors provide lateral stabilization and holdback, respectively.

An escort vessel would accompany the lay barge in congested areas to ensure that pleasure craft and commercial vessels are fully aware of the construction work and any temporary clearances they may have to observe.

2.3.2 Trenching and Pipe Lowering

This refers to the process used to install the pipeline below the natural bottom of the seabed. Iroquois' proposed methods for installing its pipeline dredging and plowing. The pipeline would be installed below the seabed level whenever feasible, and Iroquois proposes to allow the trench to backfill naturally through sediment deposition. In the shallow Long Island Sound area approaching MP 17.1, the pipeline may be covered with material such as clay, silt, sand or stone to fill the trench over the pipeline to provide protection for the pipeline from waves and currents, seabed erosion, damage by foreign objects, or unanticipated loads. The marine pipeline would generally have cover depths ranging from 3 feet to 12 feet, depending on site-specific conditions and permit conditions and approvals. At certain locations, such as crossings of shallow buried pipeline or cables and in hard bottom conditions or bedrock outcrops (not anticipated), the top of the pipeline may be located above the seabed and armored with rock.

The seabed soils vary along the route, and include clays, silts, sands, and glacial till (a mixture of clay, sand, silt, gravel and boulders). Because of the variability in seabed material, different trenching methods may be used in different areas. The following methods may be used.

Dredging

Dredging would be accomplished by cutting action followed by removal of material by pumping or mechanical displacement. Cutting heads are varied to suit the soils conditions along the route. Dredging would be appropriate for use in most bottom conditions except rock.

Dredges can be used in a wide range of ways to suit site conditions and environmental restraints. Floating dredges are best deployed in sheltered waters (close to shore) of less than 100-foot depth. This type of dredge would likely be used for trenching at the tie-in point (MP 0.0) for an estimated 211 feet and again for approximately 3,168 feet prior to the Shoreham, New York landfall. Other potential dredging methods could include clamshell buckets deployed from a floating vessel (workbarge) or from a fixed work platform on a sheetpile wall (as for shore approach); a dredge line; or from tracked vehicles working on the beach (upper sections of shore approach).

Plowing

Plowing involves displacement of sediments by a plow as it is pulled forward by the pull-barge or lay barge. It is best suited to consistent silty clay and may not be feasible in highly variable or certain unsuitable soil conditions. The trench may be plowed either before pipelay using skids or after pipelay by riding the pipeline on rollers. The plow penetrates the seabed and opens the trench, depositing the material on each side in a heaped windrow.

Iroquois proposes to use the plow for approximately 16.5 miles of the offshore route. If plowing is determined to be infeasible at specific segments, dredging or other mechanical trenching may need to be used.

Jetting

Jetting is used after the pipeline is assembled and lowered to the sea bottom. Jetting requires water to be pumped at high pressure through pipe nozzles to displace the sediment around the pipeline. The displacement of the soil around the pipeline allows the pipeline to settle into the bottom sediment. The jetting machine rides on the seabed or the pipeline, with the work barge providing the pull force for forward motion. The jetting machine lifts the pipeline upward as it moves. Material is removed from underneath and from the sides, and the pipeline is lowered several feet (depending on soil conditions) after each pass. Multiple passes are required if trenching depths greater than 3 feet are required. During jetting operations, localized infilling of the trench occurs immediately behind the jetting operations, providing early partial burial of the pipe. The longer-term flushing influence of the tidal currents and wave action also provides natural infilling of the trench. Jetting is appropriate where sand is the principal bottom material. A typical jet sled trenching operation is shown in figure 2.3.2-1.

Iroquois does not propose to use jetting, but if plowing is determined to be infeasible at specific segments, Iroquois may consider the use of jetting in these areas. Actual methods used would be dependant upon results achieved in the field and are subject to variability of site conditions.

2.3.3 Backfilling

At most locations, Iroquois has proposed that the trench be allowed to backfill naturally through sediment deposition. Backfilling may occur concurrently with trenching or separately. Backfilling may be accomplished using a burial plow, or else with a clamshell, cutter-suction, or trailing suction dredge to place material. The fill material may be taken from spoil material stockpiled alongside the trench, from hoppers on the dredge vessel, or from a storage vessel moored alongside. The exact equipment to be used would be determined by equipment availability at the time of construction. Because of the potential impact to marine resources from a non-backfilled trench, we have recommended that Iroquois backfill the trench to within +/- 1 foot of the original contour where possible (see section 3.4.1).

Where necessary, such as where the pipeline crosses foreign utilities, crushed rock may be dumped over the pipeline in large quantity using a split-hopper barge or similar vessel. A fall-pipe vessel may be used to place select fill (e.g., crushed rock or equivalent) over the pipeline. This may be done either with a modified scow with a side-mounted fall-pipe, or by a custom-built fall-pipe

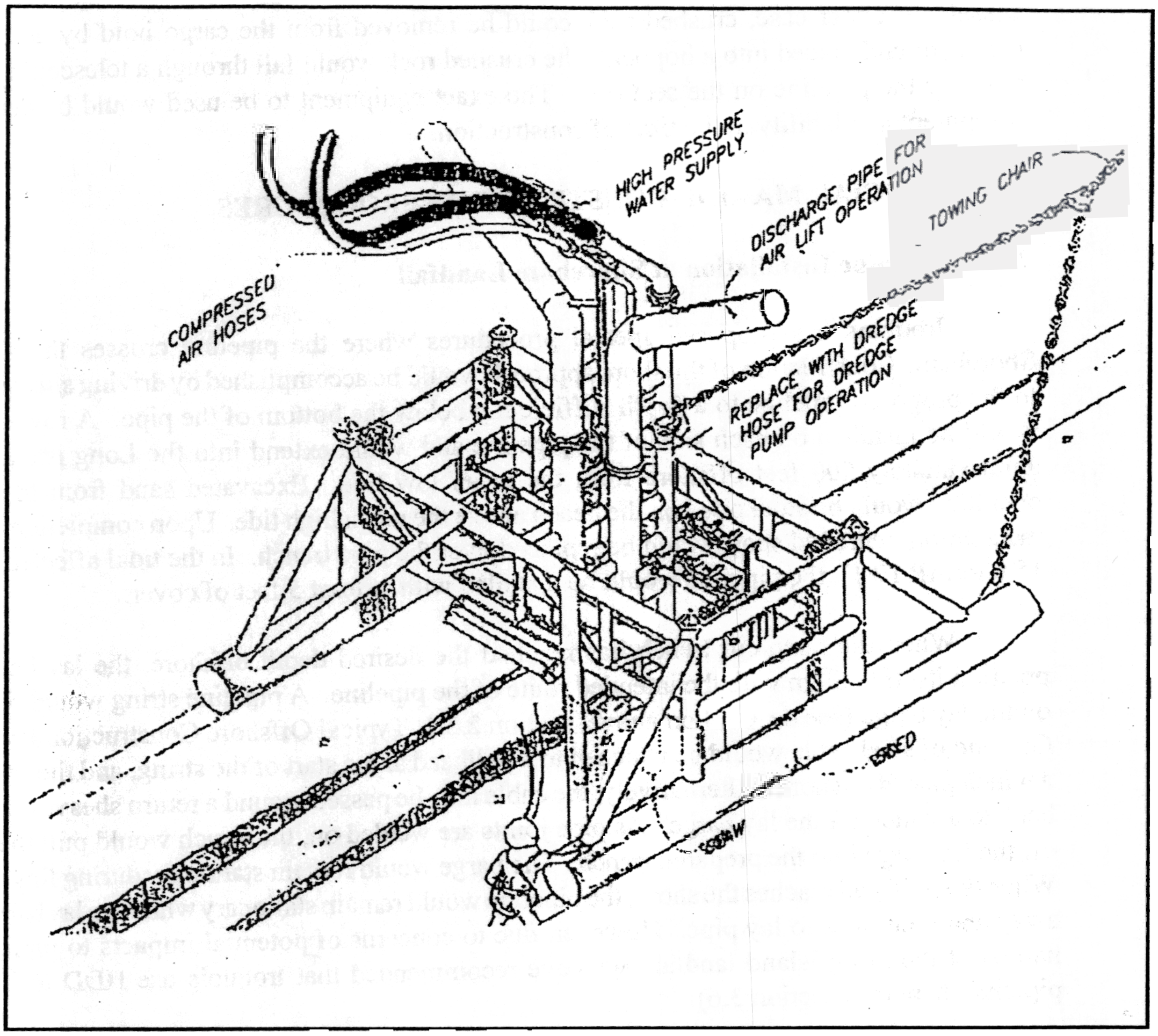

Figure 2.3.2-1 - Jet Sled Detail

vessel. In either case, crushed rock could be removed from the cargo hold by an excavator or conveyor and placed into a hopper. The crushed rock would fall through a telescoping guide tube to cover the pipeline on the seafloor. The exact equipment to be used would be determined by equipment availability at the time of construction.

SPECIAL MARINE CONSTRUCTION PROCEDURES

Pipeline Installation at Shoreham Landfall

Iroquois has proposed special procedures where the pipeline crosses the shoreline at Shoreham. Construction of the shore approach would be accomplished by driving sheetpile parallel to the proposed pipeline to a depth sufficiently below the bottom of the pipe. A row of sheetpile would be installed on each side of the pipeline and would extend into the Long Island Sound to approximately 500 feet offshore from the mean low tide. Excavated sand from the trenching operation would be stockpiled on the beach above the mean high tide. Upon completion of the pipe installation, removed spoil would be replaced over the pipe trench. In the tidal affected zone (MP 15.0 to MP 17.1), the pipeline would be installed with at least 5 feet of cover.

When the open-cut trench has reached the desired depth offshore, the lay barge would position itself to align with the intended route of the pipeline. A pipeline string would be made up on the lay barge (see description above, section 2.3.1, Typical Offshore Construction Procedures). One end of steel cable would be attached to a pullhead at the start of the string, and the other end to a winch placed onshore. Alternatively, the cable may be passed around a return sheave onshore and back to a winch on the lay barge. As pipe joints are welded on, the winch would pull the pipeline off the lay barge into the prepared trench. The barge would remain stationary during this pipe pull. When the pullhead reaches the shore, the pipeline would remain stationary while the lay barge moves away and continues to lay pipe. However, due to concerns of potential impacts to piping plover habitat at the Long Island landfall, we have recommended that Iroquois use HDD to install the pipeline there (see section 3.6).

Offshore Tie-Ins

Since the lay barge must remain floating clear of the shoreline, laying of the pipe must proceed from the shore outwards, and at least one offshore mid-line tie-in must be made. The location would depend on the installation sequence. The lay barge would install the pipeline strings separately to the point where they meet. The barge would then re-position until it is suitably aligned with the overlapping pipeline ends. Both strings would be lifted a few feet above the water, matching cuts would be made, and the pipeline welded together. When the tie-in weld has been inspected and accepted, the pipeline would be lowered back to the seabed. In deeper water an extra work vessel may be required to provide extra lift to the pipeline to ensure that lengths are fully supported.

Other Pipeline and Cable Crossings

The marine pipeline would cross several existing communication cable utilities. Iroquois carried out a marine survey in 2001 using a magnetometer and side scan sonar to identify locations of pipeline and cable crossings. Table 2.4.3-1 lists the foreign lines detected in the survey. Iroquois would develop detailed crossing methods, subject to approval by FERC, after consideration of any comments by the owner of the cable and other appropriate regulatory authorities. Potential crossing methods would include bypass, going under existing utilities, and going over existing utilities with protective barrier or support for the pipeline to structurally separate the other utilities.

TABLE 2.4.3-1
Foreign Lines Identified During the Hazard Survey

Cable	Approximate Milepost	Easting[1]	Northing[1]	Water Depth (ft)	Crossing Intersection (Degrees)
ATT[2]	7.8	2204653.53	14927941.3	93	50-60°
Flag Atlantic[3]	10.8	2213233.84	14914692.6	114	60-70°
MCI[2]	14	2222521.20	14900352.3	82	70-80°

[1] Datum referenced is World Geodetic System 1984; units are international feet.
[2] These cables provided no magnetometer response (cable positions only approximate).
[3] This cable had a magnetometer response from 5-12 gammas. A plow scar was identified indicating the cable is newly installed.

2.5 GENERAL ONSHORE CONSTRUCTION PROCEDURES

Before the start of onshore pipeline construction, Iroquois would finalize land surveys; locate the pipeline centerline, construction ROW, and extra workspaces; and complete land or easement acquisition. If necessary land rights or easements cannot be obtained through good faith negotiations with landowners and the project has been certificated by the Commission, Iroquois may use the right of eminent domain granted to it under Section 7(c) of the NGA to obtain a ROW. Iroquois would still be required to compensate the landowners for the ROW, as well as for any damages incurred during construction. However, the level of compensation would be determined by the appropriate state or Federal court according to state laws. The Commission does not take part in these proceedings. The legal process and compensation established by eminent domain are not NEPA issues and lie beyond the scope of this EIS.

Onshore pipeline construction generally proceeds as a moving assembly line and is summarized in the following sections.

2.5.1 Marking the ROW

Land survey crews would mark the boundaries of the construction ROW and extra workspaces with flags or stakes to show the approved work areas. Paint may also be used at road crossings. Areas to be avoided, such as wetland boundaries, cultural resources sites, and sensitive species habitat, would also be marked with appropriate fencing or flagging. Buried utilities would be identified and marked. The centerline for the pipeline would be marked at frequent intervals, at known crossings of the utilities.

2.5.2 Clearing and Grading

Initial ROW preparation would involve clearing and grading to provide a relatively level surface for trench excavating equipment or compressor station facilities and a sufficiently wide work space for the passage of equipment. Vegetation would be removed by mechanical cutting or by hand, and other obstructions, such as large rocks and stumps, would be removed by using a clamshell or moved to one side of the route. Woody debris would be shipped or disposed of according to applicable regulations. Disposal of materials taken off site would be done at commercial facilities or at other locations approved by FERC. Non-woody vegetation may be mowed. Temporary fences and gates would be installed as needed. Minimal grading would be required in flat terrain.

Trenching

The trenching crew would then excavate a ditch to a depth sufficient to provide the required depth of cover. Minimum depths of cover over the pipe as specified by the U.S. Department of Transportation (USDOT) would be at least 3 feet. The trench would normally be at least 1.5 feet wider than the diameter of the pipe. Excavated soil would be temporarily stored on the non-working side of the ROW or in extra workspaces. Topsoil would be stripped and segregated from subsoil in all residential and agricultural areas and where requested by the land owner. Backhoes or other mechanical equipment would normally be used to excavate the trench.

2.5.4 Pipe Stringing, Bending, and Welding

Pipe would be moved onto the project site by truck and placed in pipe storage yards prior to construction. The pipe laying or stinging operation would involve transporting pipe sections (joints) into position along the prepared ROW. Typically, trucks or other vehicles would travel along the ROW and lay or string the individual joints parallel to the centerline of the trench for bending, welding, coating, and lowering-in operations and the associated inspection activities.

Pipe would typically be delivered in straight sections. After stringing, pipe would be bent to conform to changes needed for pipeline alignment and natural ground conditions. Bending is typically performed by truck mounted, hydraulic, pipe-bending machines.

After the pipe is bent, it would be aligned and welded. Each weld would be inspected visually and by x-ray to ensure structural integrity and compliance with USDOT regulations and the latest edition of American Petroleum Institute Standard 1104. The welds that do not meet established specifications would be repaired or cut out and replaced with new welds. Once all welds are approved, the welded joints would be coated with a protective epoxy to protect the pipe from corrosion.

Lowering In and Backfilling

Side boom tractors or cranes would be used to lower the pipe into the trench. If the bottom of the trench is rocky, sandbags or support pillows would be placed at designated intervals along the trench to protect the pipe. Trench dewatering may be required at certain locations and would be performed in accordance with the Procedures as well as state and local ordinances. The trench would be backfilled using a bulldozer, backhoe, auger-type backfilling machine, mormon board, or other suitable equipment.

Backfill would usually consist of the material excavated from the trench, but additional backfill from other sources may be required in some areas. Excess excavated materials or materials unsuitable for backfilling would be spread evenly over the ROW or disposed of in accordance with applicable regulations. In areas where the topsoil has been segregated, the subsoil would be placed in the trench first and then the topsoil would be placed over the subsoil. The trench would be backfilled approximately to the original grade and a soil crown would be placed above the trench, at the direction of the Iroquois inspector, to accommodate future soil settlement.

Hydrostatic Testing

After backfill, the pipeline would be hydrostatically tested in accordance with USDOT specifications (49 CFR Part 192). Testing would be done in segments using sea water from Long Island Sound for the offshore section and freshwater for the onshore section. Iroquois has not identified the specific sources to date, but anticipates that 950,000 gallons would be needed for the onshore section and that it would be obtained from either Brookhaven National Laboratory (BNL) or the Suffolk County water system. Test water would be pumped into each test section, pressurized to design test pressure, and maintained at that pressure throughout the test. Any leaks would be repaired and the pipeline retested until the specifications are met. Iroquois states it would not add any chemicals to the hydrotest water to reduce the potential for corrosion, remove oxygen from the test water, or remove bacteria that may cause corrosion. After hydrostatic testing, the line would be de-watered and then dried. Iroquois has not identified discharge locations yet for the onshore hydrostatic test water, but it would likely be discharged either into upland sites using erosion controls, or into a municipal storm water drainage system in accordance with applicable regulatory requirements. Seawater would be discharged back into the Long Island Sound upon completion of the test.

2.5.7 Cleanup and Restoration

After the completion of backfilling, disturbed areas would be graded and remaining debris would be properly disposed of. The ROW would be protected by the implementation of erosion control measures, including site-specific contouring, reseeding or planting, and mulching, in accordance with FERC's Plant and Procedures.

2.6 SPECIAL ONSHORE CONSTRUCTION TECHNIQUES

Residential Construction

Specialized techniques could be used, such as drag section and stovepipe construction, to reduce the amount of construction ROW required in residential areas (MP 21.4 to MP 21.9). In drag-section construction, several sections of pipe would be prefabricated before trenching, the trench would then be dug, the drag section installed, and the trench immediately backfilled. For stovepipe installation, a short section of trench would be dug, a section of pipe would be laid and welded into place, and that section of the trench would be immediately backfilled.

Road Crossings

Construction across roads and highways would be completed in accordance with the requirement of road crossing permits. Traffic warning signs, detour signs, and other devices would be used as required by regulatory agencies.

Where good soil conditions exist, Iroquois proposes that hard surface roads could be crossed by boring. This would allow the road to remain open to traffic but would require extra workspace on both sides of the crossing for excavating pits for the pipeline and additional construction equipment.

Where ground conditions are unsuitable for boring and where allowed by regulatory agencies, roads would be open-cut. Although Iroquois believes it could successfully bore beneath all paved roadways, if a bore failure requires an open-cut instead, this would involve crossing the road in stages, and Iroquois would ensure that traffic is maintained. During construction, efforts would be made to minimize delays, public inconvenience, and disruption of traffic flow. Open-cut roads would be repaired properly and inspected to ensure the roadway meets regulatory requirements. Cathodic protection stations and pipeline markers would be installed along the ROW in accordance with 49 CFR Part 192.

2.6.3 Blasting

Blasting may be necessary if bedrock or rock outcrop is encountered. Blasting would be performed by registered licensed blasters who would be required to secure necessary permits and comply with legal requirements in connection with the transportation, storage, and use of explosives, and blast vibration limits for nearby structures and utilities. See section 3.1.1.2 of the EIS for more details on blasting requirements and procedures for the project.

2.6.4 Wetlands

Construction in wetlands would be in accordance with the Procedures. Construction across non-saturated wetlands could generally be accomplished by conventional pipeline construction techniques. In saturated soils, construction would normally occur by assembling the pipeline in an upland area, lowering it into the trench and pushing/pulling it along the trench through the wetland. Equipment operation in wetlands would be minimized. Ground contours and surface hydrology would be restored, and temporary and permanent erosion controls would be installed to prevent sediment transport from the construction area.

2.6.5 Waterbody Crossing Construction

The ELI Project involves a crossing of the Peconic River and Carmans River. Iroquois proposes to construct the pipeline across the Peconic River using either open-cut techniques or boring beneath the river (if flowing), and the Carmans River using HDD. Construction across both rivers would be performed in accordance with FERC's Procedures and the SPCC Plan, and the Storm Water Pollution Prevention Plan to protect stream water quality and riparian habitat. Both techniques are described below. However, the (NYSDEC) has indicated that they would not approve an open cut crossing. We have therefore recommended that Iroquois use the bore method.

2.6.5.1 Open-Cut or Bored Crossing

The proposed pipeline would cross the Peconic River immediately adjacent to the east side of the William Floyd Parkway partially within the BNL. Because the river is intermittent, it is not expected to be flowing at the time of construction. The Peconic River is culverted under the William

Floyd Parkway where the pipeline is proposed to cross. The crossing of the Peconic River could be conducted by either a bore or conventional open cut method depending on the existing elevation of the culvert. As mentioned above, we have recommended the bore method.

2.6.5.2 Horizontal Directional Drill

The proposed pipeline would cross the Carmans River on the southern side of Long Island Expressway, where the river abuts the Southhaven County Park. Iroquois proposes to cross the Carmans River using the HDD technique, which is expected to avoid any impacts to the river and surrounding riparian habitats.

The drill length would be approximately 1,330 feet. Iroquois has developed a contingency plan that identifies an alternative crossing technique to be used should the HDD be unsuccessful. Iroquois states that its proposed HDD should be feasible, given the proximity to a KeySpan Energy Delivery gas main that was also installed under the river using the same technique. Iroquois would consult with state and county officials to minimize disturbance at each river crossing.

2.6.6 Unstable Soils

Specialized construction techniques would be used in areas of unstable soils resulting from non-cohesive material and a relatively high water table. These soil conditions affect construction in several ways: they increase potential safety hazards, require supplemental weighting or pipe restraints to provide negative buoyancy, increase trench and excavation widths because of unstable side slopes, increase the likelihood of running spoil, require dewatering to complete work in the trench and excavations, and complicate roadway boring.

In addition, extra workspaces would be needed. Specialized techniques to address these issues may include the following:

> Dewatering techniques in high water table areas where entry to the trench is required. The use of these techniques would be limited to small, discrete areas such as borepits for road crossings. Necessary approvals for discharge of the collected groundwater would be acquired and appropriate BMPs to mitigate impacts would be used; and
>
> Weighting of the pipe to achieve negative buoyancy may be done using concrete coating, set-on weights, or other anchoring methods.

2.7 ABOVEGROUND FACILITY CONSTRUCTION PROCEDURES

2.7.1 Compressor Station

Construction activities for the new compressor station at Devon include developing the new permanent access road, grading the site to prepare a level surface for movement of construction vehicles and to prepare the foundation areas; installing foundations and utilities for the buildings; erecting the buildings and other structures; developing parking areas; and installing the various compressor and auxiliary equipment, piping, and other electrical and mechanical systems. After the completion of start-up and testing, or as soon as weather and other conditions permit, the construction areas would be final graded and landscaped.

Construction activities at the existing Brookfield Compressor Station to install the proposed gas filtration system, gas meter station, and meter building would involve much less construction and be of shorter duration than for the Devon Compressor Station. The proposed construction at the Dover compressor station would involve even fewer activities and include installing foundations for the gas cooler, erecting the structure to support the cooler, and installing various piping and other electrical and mechanical systems.

Meter Station

The proposed meter station construction at MP 29.1 would involve the following activities: constructing a permanent access road; clearing and grading; installing utilities; constructing foundations; installing below-ground piping; erecting buildings; installing equipment including a prefabricated meter skid; pressure testing gas pipelines; final grading; fencing; paving parking areas; and final site cleanup and landscaping.

2.7.3 Receiver Facility

One new Receiver Facility would be constructed within the proposed meter station layout at MP 29.1 the project terminus. The receiver facility is a small above ground facility used to retrieve internal pipeline tools known in the industry as "pigs". The sequence of construction activities would be similar to those used at the compressor station, but on a smaller scale.

2.8 OPERATION AND MAINTENANCE

The proposed facilities would be operated and maintained in accordance with USDOT regulations at 49 CFR Part 192, FERC requirements, and other applicable Federal, state, and local regulations. These activities would include inspection and maintenance of the facilities, regular monitoring of the ROW, and development and implementation of a safety and environmental compliance program.

The ELI Project facilities would be monitored and controlled at the existing Iroquois Pipeline System Control Center in Shelton, Connecticut. The center monitors system pressure, flows and customer deliveries, and monitors and controls the compressors, meter stations, and mainline block valves.

2.9 FUTURE PLANS AND ABANDONMENT

Iroquois has not identified plans for future expansion of the proposed ELI Project proposed facilities. If additional demand warrants future expansion, Iroquois must apply to the Commission for a certificate, at which time an appropriate review of the proposed facilities would be conducted. Iroquois has not identified future plans for abandonment of these facilities. Any abandonment of facilities would be subject to the approval of the Commission under Section 7(b) of the NGA, and must comply with USDOT regulations and specific agreements or stipulations applicable to a specific segment of the ROW. Future abandonment would be reviewed as required by the regulations at the time of the abandonment.

2.10 PERMITS AND APPROVALS

As the lead Federal agency for the ELI Project, the Commission is required to comply with Section 7 of the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevenson Act), Section 106 of the National Historic Preservation Act (NHPA), and the Coastal Zone Management Act (CZMA). At the Federal level, required permits and approval authority outside of FERC's jurisdiction include compliance with the Clean Water Act (CWA), the Rivers and Harbors Act of 1899, and the Clean Air Act (CAA). Each of these statutes has been taken into account in the preparation of this document. The States of New York and Connecticut would require additional state-level review. Table 2.10-1 summarizes the permitting requirements for this project.

The jurisdictional facilities must be consistent with the conditions of any certificate the Commission may issue. The Commission encourages cooperation between interstate pipelines and local authorities. However, this does not mean that state and local agencies, through application of state or local laws may prohibit or unreasonably delay the construction or operation of facilities approved by the commission.

Under Section 7 of the ESA as amended, no project funded, authorized, or conducted by any Federal agency (such as the Commission) may "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined ...to be critical..." (16 USC &1536(a)(2) 1988). The Commission (or Iroquois as a non-Federal party) is required to consult with the USFWS and National Marine Fisheries Service (NMFS) to determine whether any federally listed or proposed threatened or endangered species or their designated critical habitat occurs in the vicinity of the project. If these species or habitats may be adversely affected by the project, the Commission will prepare a biological assessment to determine the nature and extent of adverse impacts, and to recommend mitigation measures. If no such species or their designated critical habitat would be affected by the project, no further action is necessary.

The Magnuson-Stevens Act (MSA) requires consultation with the NMFS regarding any project authorized, funded, or undertaken by a Federal agency that may adversely affect Essential Fish Habitat (EFH) and coordination with the NMFS to protect and enhance this habitat. EFH is the water and substrate necessary for the spawning, breeding, feeding, and growth of species managed under Fishery Management Plans established by Regional Fisheries Management Councils. The NMFS will review the project and make conservation recommendations to fulfill its obligations pursuant to the MSA.

Section 106 of the NHPA requires FERC to take into account the effects of its undertakings on properties listed on or eligible for the National Register of Historic Places (NRHP), including prehistoric or historic sites, districts, buildings, structures, objects, or properties of traditional religious or cultural importance, and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Iroquois, as a non-Federal party, is assisting us with meeting our obligations under Section 106 by preparing the necessary information and analyses as required by the ACHP procedures in 36 CFR Part 800.

The CWA requires compliance with Sections 401, 402, and 404. Water quality certification (401) has been delegated to state jurisdictions, with review by the EPA. Water used for hydrostatic testing that is point-discharged into waterbodies would require a National Pollution Discharge Elimination System (NPDES) permit issued by the state.

The COE has responsibility for determining compliance with the regulatory requirements associated with Section 404 of the CWA and Section 10 of the Rivers and Harbors Act. The EPA also independently reviews Section 402 applications and has veto power over permits issued by the COE. Section 10 permits would be required for all construction activities that occur in navigable waterways. The Section 404 permitting process regulates the discharge of dredged or fill material associated with the construction of pipelines in waters of the U.S., including territorial seas and wetlands. The COE may only issue a permit for the least environmentally damaging practical alternative that would meet the need for the project.

Ambient air quality is protected by Federal regulations under the CAA. These regulations include compliance under the New Source Performance Standards and the requirements for the Prevention of Significant Deterioration (PSD) and apply to the proposed compressor station facilities.

The CZMA provides for states to define and establish plans for management of coastal zones. States review proposed projects to determine whether they would be consistent with their coastal zone management plans. New York and Connecticut have an established coastal zone management program that establishes policies regarding the use of land and water within the designated coastal zone. Project construction may not commence until a determination is made that the project is consistent with each states Coastal Zone Management Plan.

TABLE 2.10-1

Approvals and Permits Needed for the ELI Project

Agency	Permit/Approval/ Confirmation	Activity	Status
Federal			
Federal Energy Regulatory Commission	· Certificate of Public Convenience and Necessity	Construction and operation of natural gas facilities. Requires site and record surveys, and review, approvals, and consultations with various agencies responsible for wetlands; water use and quality; vegetation and wildlife; cultural and geological resources; soils; land use, recreation and aesthetics; air and noise quality; Native American impacts, and other resources.	Submitted November 2001
U.S. Army Corps of Engineers (USCOE)	Nationwide Permit(s)	Section 404/Section 10 Permit	Submitted March 2002
U.S. Fish and Wildlife Service	· Confirmation that endangered or threatened species are not impacted	General construction and operation of the proposed project.	Submitted July and September 2001
National Marine Fisheries Service	· Confirmation that endangered or threatened species are not impacted; Essential Fish Habitat Assessment (EFHA)	Construction in Long Island Sound	Planned for September/October 2002
State – Connecticut			
Connecticut Department of Environmental Protection – Office of Long Island Sound Programs	· Structures, Dredging, and Fill permit	Construction of pipeline in Long Island Sound.	Submitted March 2002
	· Coastal Zone consistency certification	Confirmation that project is consistent with the state of Connecticut Coastal Zone Management Program.	Submitted March 2002
	· Hydrostatic Test Discharge permit	Discharge of hydrostatic test water to the Long Island Sound.	Planned for September/October 2002

[redacted]

TABLE 2.10-1 (continued)

Approvals and Permits Needed for the ELI Project

Agency	**Permit/Approval/ Confirmation**	Activity	**Status**
State Historic Preservation Office	Review under Section 106 of the National Historic Preservation Act	Cultural resource investigations and confirmation that significant cultural resources are not impacted.	Submitted November 2001
<u>State – New York</u>			
New York State Department of Environmental Conservation (NYSDEC)	· Permits to Construct/Certificate(s) to operate air contamination sources.	Air quality permit to construct and operate a stationary natural gas turbine compressor driver and emergency electrical power generator engine.	Submitted March 2002
	· State Environmental Quality Review Act (SEQRA)	Environmental Assessment Form (EAF) review of project. Also required for air permit approval.	Submitted March 2002
	· General permit to discharge stormwater	Temporary construction area disturbance of greater than five acres.	Two days prior to construction
	· Section 401 Water Quality Certification	Water quality certification if Individual Permit from the USCOE is required.	Submitted March 2002
	· State Pollution Discharge Elimination System Permit or waiver	Hydrostatic test water discharge (if applicable).	Planned for September/October 2002
State Historic Preservation Office	· Review under Section 106 of the National Historic Preservation Act	Cultural resources investigations and confirmation that significant cultural resources are not impacted.	Submitted November 2001
	Stream and Wetland Permit	Crossing streams and wetlands.	Submitted March 2002
	· Review of state protected species	Construction in protected habitats.	Submitted October 2001
New York State Department of State	Coastal Zone Consistency certification	Confirmation that project is consistent with the state of New York Coastal Zone Management Program.	Submitted March 2002

TABLE 2.10-1 (continued)

Approvals and Permits Needed for the ELI Project

Agency	Permit/Approval/ Confirmation	Activity	Status
Regional – New York			
Central Pine Barrens Planning Commission	Hardship Permit	Construction in a core preservation area.	Submitted March 2002
Local- Connecticut [1]			
City of Milford	Building Permit Septic System Permit	Local approvals for construction of Devon compressor station. May include sketch plan review, site plan approval, building height variance, excavation and fill permits, and septic system.	Planned for September/October 2002
Town of Brookfield	Building Permit Septic System Permit	Local approvals for construction of Brookfield compressor station. May include sketch plan review, site plan approval, building height variance, excavation and fill permits, and septic system.	Planned for September/October 2002
Local- New York [1]			
Town of Brookhaven	Building Permit	Local approvals for construction of meter stations. May include sketch plan review, site plan approval, excavation and fill permits.	Planned for September/October 2002
Town of Dover	Building Permit	Local approvals for adding gas cooler at Dover compressor station. May include sketch plan review, site plan approval, building height variance, excavation and fill permits, and septic syste.	Planned for September/October 2002

[1] Local towns have various permitting requirements. Iroquois plans to coordinate with the Towns and the Counties, and to comply with State and local laws, to the extent that compliance would not conflict or be inconsistent with FERC authorizations, certifications, or schedules.